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AUTHORITY

ATD ltr, 2 Dec 1965

TITLE: Studies on the fluorination behaviour of UO_2 powders of various activities.

PERIODICAL: Kernenergie, no. 2, 1962, 112-113

TEXT: The U/O ratio and fluorination of various uranium dioxide powders were investigated as a function of the conditions of their preparation. The powders were prepared from $UO_4.xH_2O$ by thermal decomposition under dry or wet conditions, followed by reduction with hydrogen at temperatures from 550 to 1000°C.

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Studies on the fluorination....

The uranium peroxide was precipitated by means of H_2O_2 from uranyl nitrate solutions at pH values of 1.0 to 3.5 and at 30, 40 or 60°C. Slight activity changes resulted from the various precipitation conditions. The U/O ratio decreased from about 2.3 to less than 2.1 with increasing reduction temperature, while the pretreatment of the amorphous UO_2 with water vapor further inactivated the powders. Fluorination with anhydrous HF was carried out batchwise at 475°C inside an induction-heated graphite crucible within a nickel reactor. The more active powders left less than 0.1% of unreacted UO_2 after 30 minutes, but most of the reaction occurred within thirty seconds. By contrast a deactivated sample was still 20% unreacted after half an hour. Electron microscope examination of the resultant fluorides showed extensive

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sintering of the products. There are 3 figures and 2 tables

ASSOCIATION: Institut für angewandte Physik der Reinststoffe, Dresden; Director: Prof. Dr. E. Rexer (Institute of Applied Physics of Pure Materials, Dresden; directed by Prof. Dr. E. Rexer)

SUBMITTED: October 6, 1961